

# PATENT SPECIFICATION



Application Date: Aug. 24, 1933. No. 23,554 / 33.

406,220

Complete Accepted: Feb. 22, 1934.

## COMPLETE SPECIFICATION.

### Improvements in Machines for Moulding Plastic Substances.

I, ALBERT HENKEL, Junior, a German Citizen, of 69, Holland Park, London, W.11, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to machines for moulding plastic substances and more particularly to that type of apparatus in which a strip or strand of plastic material for example, sweetmeat, soap, or like plastic substance is divided and moulded into separate moulded pieces.

The strand of plastic substance after first being accurately calibrated in a suitable equalizing device is fed into the machine where it is indented or divided into separate pieces. The separate pieces or sections are then clamped in moulding chambers and are there moulded by dies into the forms of spheres, tablets, animals, fruits, or any other desired shapes.

Broadly the invention consists of the arrangement, in a machine for dividing and moulding a strip or strand of plastic material into separate pieces, of a moulding wheel or drum, axially movable lateral dies, and radially movable external dies on a common rotating shaft.

The moulding wheel or drum, is provided around its periphery with cut-out portions or grooves corresponding to about half the cross section of the pieces to be moulded, the said drum being completely surrounded on its periphery by three groups of dies. Two groups of dies, hereinafter referred to as lateral dies, are in the form of plungers and are arranged on each side of the drum in an axially slidible manner, their heads, which in cross section correspond to the pieces to be moulded, engaging in the cut-out por-

tions or grooves on the periphery of the moulding wheels or drum. The heads of these lateral dies may be engraved according to the marking required on the moulded pieces. The third group of dies, hereinafter referred to as external dies, is formed on the side facing the moulding wheel or drum in accordance with the shape of the pieces to be moulded and

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temporarily encloses the spaces formed by the grooves on the periphery of the moulding wheel or drum and the axially slidible lateral dies, so that closed moulding chambers are formed, wherein the plastic substance is compressed to form the required moulded pieces under the action of the axially moving dies.

In order that, on the one hand, the strand may be fed into the spaces formed by the moulding wheel or drum and the lateral dies and that, on the other hand, the moulded pieces may leave the moulding chambers, the external dies must periodically move away from the moulding wheel or drum. To enable this to be done the external dies are mounted adjacent the moulding wheel or drum either pivotally or in an axially slidible manner. In order that the external dies may, in addition, exert a stamping pressure upon the strand of plastic substance, they are adapted to be moved radially.

The moulding wheel or drum and the supports for all of the dies are mounted on a common driven shaft and are rotatable, the movements of the dies being controlled by stationary guide rails.

The combination of all members to form a single rotating unit, has the great advantage that by the suitable formation of the stationary guide rails the travel of the pieces of plastic substance in the mould or the duration of pressing or moulding may be as long as desired. This is of great importance for the quality of the moulding which is more accurate the longer the pressing is continued. If the machine is used in the sweetmeat industry for the production of filled sweetmeats, an extended travel in the mould is not only desirable but necessary if the bursting of the said sweetmeats is to be avoided.

In order that the invention may be more clearly understood one particular construction of apparatus made in accordance therewith will now be described by way of example, with reference to the accompanying drawings wherein:

Fig. 1 is a sectional view of the press drum at right angles to its axis.

Fig. 2 is an elevation of the press drum

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and shows the arrangement of the groups of lateral dies, the guide bearings for the lateral dies being omitted for clearness.

5 Fig. 3 shows two forms of mounting for the lateral dies with two forms of actuating means.

Secured to the shaft 1 is a moulding wheel or drum 3 which is provided on its periphery with cut out portions or grooves corresponding to approximately half the cross section of the pieces to be stamped. Adjacent the moulding wheel or drum 3 and on each side of it supports 4 for 15 plungers or lateral dies 5 and external dies 6 are secured to the shaft 1. The lateral dies 5 are arranged either in the manner shown on the right of Fig. 3 or in the manner shown on the left of the 20 same figure. According to the arrangement on the right of Fig. 3 the lateral dies 5 are reciprocated in the bores of their supports 4 in a positive manner by means of a stationary guide rail 7 which 25 engages in recesses 8 formed in the shank of the lateral dies 5. According to the arrangement on the left of Fig. 3 the lateral dies 5 are moved towards the moulding wheel or drum 3 under the 30 action of a stationary guide rail 7a while the reverse movement is effected by springs 9. In order that the external radial dies 6 may perform a radial movement they are pivotally mounted in the 35 supports 4, as will be seen in Fig. 3, with a comparatively large bearing play. Said external radial dies 6 are furthermore provided with guide fingers 10 adapted to be guided by stationary guide rails 11, 40 11a. The guide rails 11, 11a cause the external radial dies 6 to pivot through an angle of about  $90^\circ$ . The guide rail 11, which causes the external dies to be pivoted from the radial position into the axial position (Fig. 1) is preferably made sufficiently wide to provide a rest for the whole of the outside face of the external radial dies 6, since this rail after having moved the external dies 6 presses them 45 radially into the strand of plastic material and therefore has to withstand considerable stresses. The calibrated strip of plastic substance is fed into the machine through a feed trough 12, and the finished 50 moulded pieces are discharged through a discharge trough 13.

In operation, the strand of plastic substance which has previously been calibrated in an equalising device in 60 known manner is fed into the moulding machine through a feed trough 12. The strand enters the spaces formed between the cut-out portions or grooves on the periphery of the moulding wheel or drum 3 and the plungers or lateral dies 5

tangentially, and is seized and carried on by the external dies 6 which are moved into closed position under the action of guide rail 11, as will be seen in the top left hand part of Fig. 1. As the rotation of the moulding machine continues the strand is pressed between the external dies 6 and the moulding wheel or drum 3, so that a separate piece thereof will be located in each moulding chamber formed by the cut-out portions or grooves of the moulding wheel or drum 3 and the lateral and external dies 6. The degree of pressure between the external dies 6 and the moulding wheel or drum 3 depends upon the adjustment of the guide rail 11 and can be such as to cut the strand into separate pieces or only such as to leave a thin web between said pieces. As soon as this is accomplished, the lateral and external dies 5 and 6 are closed, and the lateral dies 5 are advanced under the action of the guide rail 7 towards the pieces of material located in the moulds and press them into the desired shape. The indentation of the strand by the external die 6 as well as the forming of the moulded pieces thereof by the lateral dies 5 is performed during a period of time extended as desired by the suitable formation of the guide rail 11. As soon as the moulding of the pieces by the dies 5 is completed, the external dies 6 are swung outwardly their guide fingers moving up on the guide rail 11a (Fig. 1). The finished moulded pieces then leave the moulding machine through the discharge trough 13.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In a machine for dividing and moulding a strip or strand of plastic material into separate pieces the arrangement of a moulding wheel or drum, axially movable lateral dies, and radially movable external dies on a common rotating shaft.

2. A machine for dividing and moulding a strand of plastic material into separate pieces according to claim 1 wherein the axially movable lateral dies and the radially movable external dies are controlled by stationary guide rails, the said external dies being withdrawn from the moulding wheel or drum at the entrance of the strand into the machine and being then moved under the action of stationary guide rails towards the moulding wheel or drum during the continued rotation of the machine indenting or dividing said strand into separate pieces and, in conjunction with the lateral dies advancing

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from both sides, moulding said separate pieces into the desired shape, said external dies then being moved back out of the plane of the press drum for the purpose of releasing the moulded pieces.

3. A machine for dividing and moulding a strip or strand of plastic substance into separate moulded pieces according to claims 1 or 2, characterised in that the lateral and the external dies are mounted in supports which are mounted on the shaft of the moulding wheel.

4. A machine for dividing and moulding a strip or strand of plastic substance into separate moulded pieces according to claims 1 or 2 and 3, characterised in that the lateral dies are slidably mounted in bores formed in the supports and are reciprocated in said bores by a guide rail which engages in recesses formed in the shank of said dies.

5. A machine for dividing and moulding a strip or strand of plastic substance into separate moulded pieces according to claim 1 or 2 and 3 characterised in that the lateral dies are so mounted in their supports that they are caused to move towards the moulding wheel by a

guide rail and returned by springs.

6. A machine for dividing and moulding a strip or strand of plastic substance into separate moulded pieces according to claims 1 or 2 and 3 characterised in that the external dies are pivotally mounted on the support in which the lateral dies are mounted.

7. A machine for dividing and moulding a strand of plastic material, into separate pieces according to claim 6, wherein the external dies are arranged parallel to the axis of the moulding wheel and are mounted in their bearing with a considerable amount of play, in order that said external dies may perform a radial movement in addition to their pivoting movement.

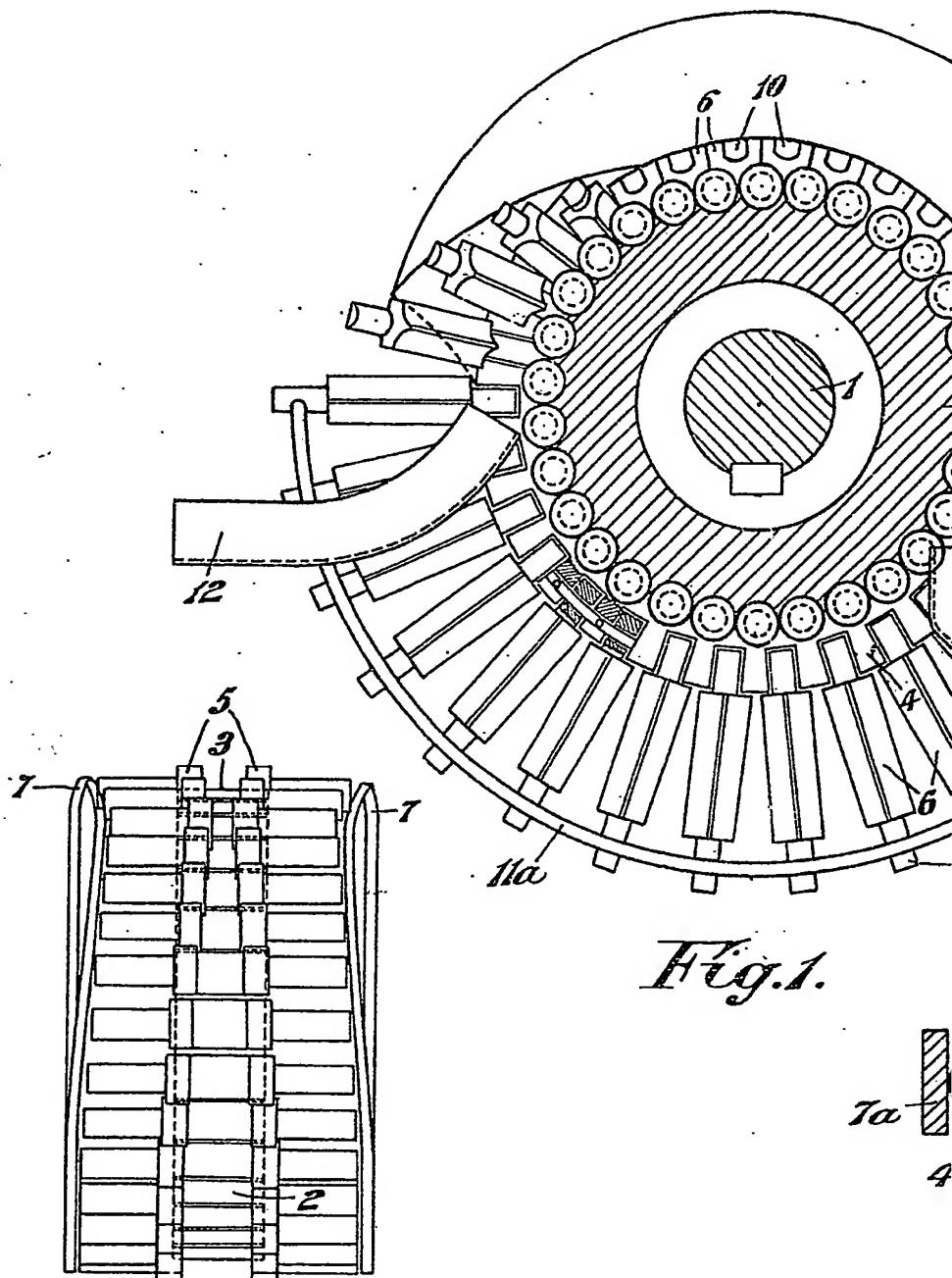
8. A machine for dividing and moulding a strip or strand of plastic substance into separate moulded pieces substantially as described with reference to the accompanying drawings.

Dated this 24th day of August, 1933.

A. A. THORNTON,  
Chartered Patent Agent,  
7, Essex Street, Strand, London, W.C. 2,  
For the Applicant.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1934

*[This Drawing is a reproduction of the Original on a reduced scale.]*



*Fig. 1.*

*Fig. 2.*

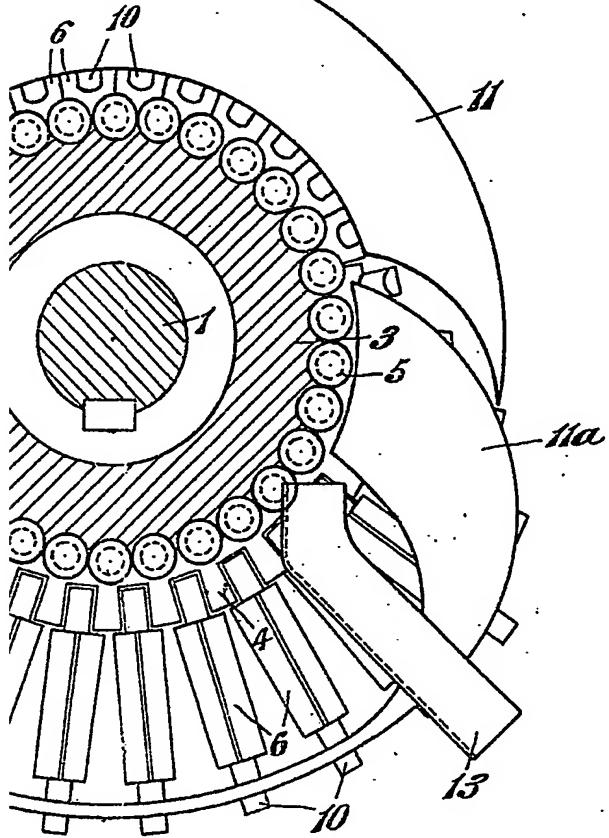


Fig. 1.

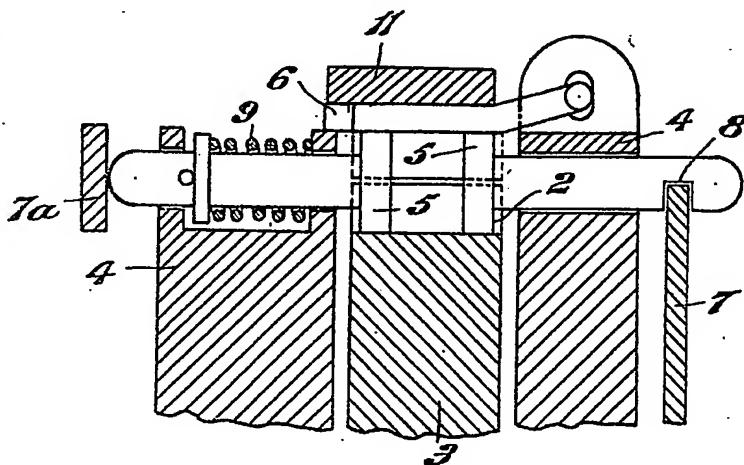


Fig. 3.

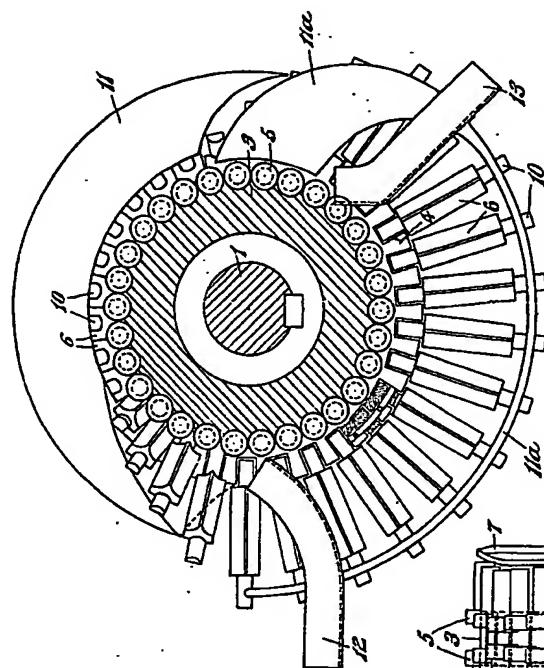


Fig. 1.

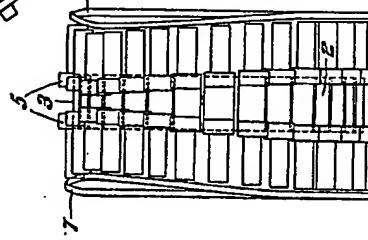


Fig. 2.

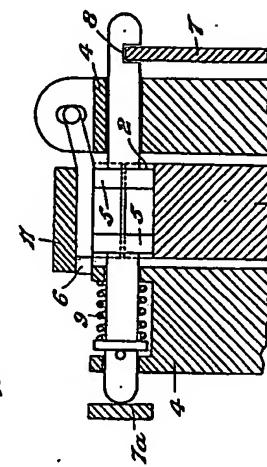


Fig. 3.

(This Drawing is a reproduction of the Original on a reduced scale)